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ABSTRACT

This paper reviews and summarizes selected findings concerning two hypotheses about perceptual abilities; field dependence-independence and the Carpenter Theory. The conclusion of the paper discusses the implications and applications of these research findings to the pedagogy for Asian American students. The review indicates that different ethnic groups have different perceptual abilities. However, attempts to find the causes of these differences have produced different and at times conflicting results. Very few of the studies cited were conducted with Asians, and none has investigated the perceptual abilities of Asians in the U.S. While all the studies indicated that Mexican Americans possess a field dependent cognitive style, there is no evidence that Asian Americans are more field dependent than Anglo Americans. In fact, Chinese Americans and Japanese Americans have been shown to be about equal to or to surpass Anglos on mathematics and reasoning abilities. Studies have shown that Asian Americans possess distinct mental ability profiles which are different from those of other non Asian ethnic groups. Future research studies should be directed towards the identification of the unique cognitive ability profiles of Asian Americans and these findings should be applied to the development of pedagogic approaches which are relevant to Asian Americans. (Author/AM)

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A Summary of Selected Research Studies On Cognitive and Perceptual Variables

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FORWARD

ASIAN AMERICAN PERSPECTIVES ON EDUCATION is a continuing series of monographs intended to spark debate and action among those concerned about equal and quality education for all children in the United States. Topics included in the series range from preschool education in China and its implications for American early childhood education to the advocacy of a particular model for Filipino bilingual education programs in the United States.

The series was born as the result of the Asian American Bilingual Center's efforts to develop bilingual multicultural curriculum of relevance to classrooms throughout the country. Funded by ESEA Title VII in 1975 to produce educational materials for Asian American children of Chinese, Filipino, Korean, Japanese and Samoan heritage, the Center initiated the publication of a national newsletter. The newsletter not only attempts to inform interested persons in the specific work of the project but also features a supplement which highlights a more general educational issue. Contributors have included Ling-chi Wang, Estela Pinga, NVM Gonzalez and Itty Chan. Their articles have stimulated great interest among the one thousand readers of the newsletter. Thus, ASIAN AMERICAN PERSPECTIVES ON EDUCATION was conceived.

In this issue, "A Summary of Selected Research Studies on Cognitive and Perceptual Variables," written by Victor Hsi and Virginia Lim, is presented. Virgina Lim and Victor Hsi worked as research assistants for the Center. Virgina Lim is currently a law student at Boalt Hall, University of California, Berkeley. Victor Hsi is currently in Taiwan.

The Center welcomes not only your comments and reactions to the series but also any articles which you may want to contribute. For further information write or call:

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ASIAN AMERICAN BILINGUAL CENTER

Reasearch and Evaluation Working Paper No. 1

Victor Hsi and Virginia Lim

INTRODUCTION

Educators have attempted to understand the causes of poor performance in American schools and on intelligence tests by children of ethnic minority groups. Research studies revealed that students from different ethnic backgrounds differed in their mental ability profiles (Lesser, Fifer & Clark, 1965; Stodolsky & Lesser, 1967; Backman, 1970, 1972; Begle & Pence, 1975). Another series of studies showed that Mexican-Americans are more field dependent in their perception than Anglos (Ramirez & Castaneda, 1974). It was suggested that ethnic minority group students in the United States possess a field dependent cognitive and learning style while Anglo students possess a field independent cognitive and learning style. Consequently, if the school achievement of the ethnic minority group students is to improve, the traditional pedagogic approach designed for Anglo students should be replaced by an alternative approach which is tailored for the field dependen cognitive and learning style (Ramirez et al., 1974).

This paper reviews and summarizes selected research findings concerning two hypotheses about perceptual abilities: field dependence-independence and the Carpenter theory.

The conclusion of the paper discusses the implications and applications of these research findings to the pedagogy for Asian-American students.

FIELD DEPENDENCE-INDEPENDENCE

The concept of field dependence-independence can best be explained by an instrument that measures this ability. The Rod and Frame Test consists of a straight rod attached to a square frame (both are luminous). The subject sits in a darkened room facing the apparatus. The experimenter then tilts the rod or the frame or both at various angles. The subject is asked to adjust the rod until it appears to him vertical with the ground. Those subjects who are able to adjust the rod without reference to the frame are field independent while those who tend to adjust the rod in relation to the square frame are field dependent. More generally, field dependence-independence refers to the relative ability to separate an object from its background. Other instruments that measure field dependence-independence include the Embedded Figures Test and the Tilting Room - Tilting Chair Test (Buros, 1965, 1972).

The field dependence-independence variable has been investigated in many cross-cultural studies. The earlier studies linked this variable with child-rearing practices.

Witkin (1966) found that ten-year-old boys in New York City whose mothers fostered differentiation in interaction (i.e., distinguishing what is identified as the self from what is external to the self) were more field independent than other boys tested. Dawson (1963, 1967), using the Embedded Figures Test, the Kohs Block Test and subject questionnaires, obtained a correlation between maternal dominance and field dependence. The Temne tribe which he studied in West Africa stressed discipline and practised severe physical punishment while the Mende encouraged early child responsibility. The Temne were found to be more field dependent than the Mende. Dershowitz (1966) tested orthodox Jews, acculturated Jews and Anglo-Saxon Protestants and linked field dependence with the following child-rearing goals: conformity, indebtedness to parents, suppression of criticism of parents, suppression of an aggressive male role, minimum child responsibility in matters regarding care of the body and satisfaction of material needs, indulgence of the child's will, denigration of body functions and physical expression, emphasis on knowing and not on doing. MacArthur (1970, 1971), working with Igloolik Eskimos, found field independence to be associated with encouragement of separation from family control, encouragement of initiative and resourcefulness during upbringing and control of aggression. Mebane and Johnson (1970) found a relationship between field independence in the Mexican

subjects he tested and a high level of instrumental companionship, discipline and low level of prescription from the mother, as well as low physical punishment from the father.

These research findings on child-rearing practices revealed that the degree of field dependence-independence varies among different groups of people. It was hypothesized that the more "traditional" groups are more field dependent.

Dawson (1967) found that the Temne lived in a more traditional society and were more field dependent than the Mende. Bery (1966), dividing each of the three following ethnic groups - Eskimo, Temne, Scott - into traditional and transitional samples, found that the transitional group of all three was more field independent. Dershowitz's study (1966) showed that the more acculturated Jewish subjects were more field independent than the orthodox Jewish subjects, but were more field dependent than the Anglo-Saxon Protestant subjects. Ramirez, Castaneda & Herold (1974) tested groups in three communities - traditional, dualistic and atraditional - for differences in cognitive style. They found that children tested on the Rod and Frame Test were field independent if they were

more acculturated and field dependent if they lived in a community stressing social conformity. Witkin, Price-Williams, Bertini, Christiansen, Oltman, Ramirez and Van Meel (1974) compared a traditional and a modern village in each of three countries - Holland, Italy and Mexico. Traditional villages were characterized by the population's conformity to family, religious and political authority. The subjects in these villages were found to be more field dependent than those in modern villages. Park (1975) examined the rural/urban factor which includes child-rearing and traditional/non-traditional variables. The subjects were Korean 4th - 8th graders. He found that the urban group was more field independent. Chiu (1972) compared Chinese subjects in rural Taiwan with rural United States subjects. He identified Chinese child-rearing and societal characteristics as similar to the field dependent socialization cluster and American practices as similar to the field independent cluster.

Recent researchers have put forward another hypothesis which states that persons reared in an environment where socialization is harsh will possess more field dependence than persons reared in an environment where socialization is easier. A series of studies were conducted to test the hypothesis (Dawson 1969), 1972; Dawson, Young & Choi, 1974).

The results showed that, along a scale ranging from field independent to field dependent, the Eskimos ranked first, the Chinese in Hong Kong second, the African European third and the African Blacks fourth. The results in part contradict the harsh-easy hypothesis, since the socialization of the Chinese in Hong Kong was judged to be considerably harsher than that of the Europeans in Africa.

Field dependent-independence has also been investigated in relation to other cognitive and achievement variables. Field dependence-independence has been found to be related to school achievement, performance on intelligence tests (Cohen, 1969; Kagan, 1975), mathematical problem solving ability(Dodson, 1970; Webb, 1975), and creativity (Rebecca, 1974). In general, the field independent students are higher achievers and better mathematical problem solvers, but the field dependent students are more creative.

THE CARPENTER THEORY

In a cross-cultural study, Segall, Campbell and Herskovits (1966) compared non-western peoples from one location in Africa and one location in a rural area of the Philippines with western peoples from Illinois and South Africa. Subjects were presented with the Muller-Lyer illusions, the Sander parallelograms and the horizontal-vertical illusions. The object of these three tests was to compare two lines and decide which line is longer. The Muller-Lyer

illusion encourages the subject to perceive the design in three dimensions; the Sander parallelograms present an illusion affecting those not used to seeing right angles. Results indicated that Western subjects were more susceptible to the Muller-Lyer and Sander parallelogram illusions, while non-western peoples were more susceptible to the horizontal-vertical illusion. They offered the explanation that westernized people, living in a right-angled or "carpentered" environment, tend to be influenced by this type of illusions, while non-westernized people, not being accustomed to "carpentered" buildings, sidewalks and other "carpentered" structures, are less influenced.

Stewart (1973) tested the "carpenter" theory in a later study. Samples were taken of whites and blacks from Illinois and of blacks from Zambia, Africa. Each subject was tested for his susceptibility to the Muller-Lyer illusion and the Sander parallelogram. Results indicated no difference in the responses of the Illinois subjects despite their racial difference; however, the Zambian subjects were susceptible to substantially fewer illusions than the Illinois subjects.

CONCLUSION

There is evidence in the above reviewed studies to show that different ethnic groups have different perceptual

abilities. However, attempts to find the causes of these differences have produced different and at times conflicting results.

Very few of the studies were conducted with Asian, and none has investigated the perceptual abilities of Asians in the United States. While all the studies indicated that the Mexican-Americans possess a field dependent cognitive style, there is no evidence that the Asian-Americans are more field dependent than the Anglo-Americans. In fact, Chinese-Americans and Japanese-Americans were shown to be about equal to or to surpass the Anglos on mathematics and reasoning abilities (Lesser et al., 1965; Stodolsky et al., 1967; Backman, 1970, 1972), these latter two abilities being usually associated with the field independent cognitive style. Thus, though pedagogical approaches based on the field dependent cognitive style might be applicable to Mexican-American students, they should be examined with care when applied to Asian-American students.

Studies showed that Asian-Americans possess distinct mental ability profiles which are different from those of other non-Asian ethnic groups. Future research studies should be directed towards the identification of the unique cognitive ability profiles of Asian-Americans and these findings should be applied to the development of pedagogic approaches which are relevant to Asian-Americans.

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